

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

Claims 1-14 (Cancelled)

Claim 15 (New): A method of performing a handoff when a mobile terminal equipment is moving from a previous foreign agent to a new foreign agent in a mobile IP network, the method comprising the steps of:

when starting a handoff, additionally performing a regional registration of the mobile terminal equipment to a home agent performing multicasting and buffering so as to doubly register an address of the mobile terminal equipment by the previous foreign agent and the new foreign agent;

determining whether or not an IP packet is of real-time traffic when the home agent receives the IP packet destined for the mobile terminal equipment when the double registration is restored, multicasting the IP packet of real-time traffic to both the previous foreign agent and the new foreign agent, and buffering the IP packet of non-real-time traffic to the home agent; and

when the handoff is completed, requesting updating of the regional registration to the home agent so as to perform the regional registration only for the new foreign agent, and when the IP packet of non-real-time traffic is buffered, transferring the IP packet of non-real-time traffic to the foreign agent having the mobile terminal equipment by the home agent.

Claim 16 (New): A method of performing a handoff when a mobile terminal equipment is moving from a previous foreign agent to a new foreign agent in a hierarchical mobile IP network, the method comprising of the steps of:

when starting a handoff, additionally performing a regional registration of the mobile terminal equipment to a gateway foreign agent performing bicasting and buffering so as to doubly register an address of the mobile terminal equipment by the previous foreign agent and the new foreign agent;

determining whether or not an IP packet is of real-time traffic when the gateway foreign agent receives the IP packet destined for the mobile terminal equipment when the double registration, bicasting the IP packet of real-time traffic to both the previous foreign agent and the new foreign agent, and buffering the IP packet of non-real-time traffic to the gateway foreign agent; and

when the handoff is completed, requesting updating of the regional registration to the gateway foreign agent so as to perform the regional registration only for the new foreign agent, and when the IP packet of non-real-time traffic to the foreign agent having the mobile terminal equipment by the gateway foreign agent.

Claim 17 (New): A method of performing a handoff when a mobile terminal equipment is moving from a previous foreign agent to a new foreign agent in a mobile IP network, the method comprising the steps of:

when starting a handoff, additionally performing a regional registration of the mobile terminal equipment to a home agent performing bicasting and buffering so as to doubly register an address of the mobile terminal equipment by the previous foreign agent and the new foreign agent;

determining whether or not an IP packet is of real-time traffic when the home agent receives the IP packet destined for the mobile terminal equipment when the double registration, bicasting the IP packet of real-time traffic to both the previous foreign agent and the new foreign agent, transferring the IP packet of non-real-time traffic to the previous foreign agent, and buffering by the previous foreign agent the IP packet of non-real-time traffic transferred from the home agent;

when the handoff is completed and the IP packet of non-real-time traffic is buffered, transferring by the previous foreign agent the IP packet of non-real-time traffic to the foreign agent having the mobile terminal equipment; and

when the handoff is complete, requesting updating of the regional registration to the home agent so as to perform the regional registration only for the new foreign agent.

Claim 18 (New): The method according to Claim 15, wherein said home agent determines whether or not an IP packet destined for the mobile terminal equipment is of real-time traffic based on information on a header of the IP packet.

Claim 19 (New): The method according to Claim 16, wherein the gateway foreign agent determines whether or not an IP packet destined for the mobile terminal equipment is of real-time traffic based on information on a header of the IP packet.

Claim 20 (New): The handoff method according to Claim 15, wherein the home agent determines whether or not an IP packet destined for the mobile terminal equipment is of real-time traffic based on information on a upper layer, which is placed in a payload of the IP packet.

Claim 21 (New): The method according to Claim 16, wherein the gateway foreign agent determines whether or not an IP packet destined for the mobile terminal equipment is of real-time traffic based on information on an upper layer, which is placed in a payload of the IP packet.

Claim 22 (New): The method according to Claim 15, wherein said mobile IP network is a cellular phone network in accordance with Radio Access Network standards which can perform a mobile IP procedure, said mobile terminal equipment is a cellular phone, and each of said new and the previous foreign agents is a radio network control unit that can give and receive an authority to control said cellular phone, as a handoff, according to an SRNC relocation procedure.

Claim 23 (New): The method according to Claim 16, wherein the mobile IP network is a cellular phone network in accordance with Radio Access Network standards which can perform a mobile IP procedure, the mobile terminal equipment is a cellular phone, and each of the new and the previous foreign agents is a radio network control unit that can give and receive an authority to control the cellular phone, as a handoff, according to an SRNC relocation procedure.

Claim 24 (New): The method according to Claim 22, wherein said radio network control unit piggybacks a mobile IP message onto a control message according to the SRNC relocation procedure.

Claim 25 (New): The method according to Claim 22, wherein said radio network control unit detects a start time and end time of the handoff according to an SRNC relocation

procedure, and, when the cellular phone can establish communication according to mobile IP, notifies the cellular phone of the start time and end time of the handoff according to the mobile IP procedure.

Claim 26 (New): The method according to Claim 22, wherein the radio network control unit detects a start time and end time of the handoff according to an SRNC relocation procedure, and, when the cellular phone cannot establish communication according to mobile IP, notifies the cellular phone of the start time and end time of the handoff according to the SRNC relocation procedure, and autonomously performs a regional registration of the cellular phone or changes the regional registration.

Claim 27 (New): A method according to Claim 22, wherein after a plurality of radio network control units have accommodated the cellular phone, a previous one of the plurality of radio network control units have accommodated the cellular phone, a previous one of the plurality of radio network control units assumes that an SRNC relocation procedure generated after a predetermined transfer of an authority to control the cellular phone is a handoff procedure, so as to detect the start time and end time of the handoff.

Claim 28 (New): An agent apparatus, performing as a home agent or a gateway foreign agent, for transferring IP packets destined for a mobile terminal equipment in a mobile IP network, to which mobile terminal equipment is moving, the apparatus comprising:
a means for, upon receiving an IP packet destined for the mobile terminal equipment when the mobile terminal equipment is doubly registered during a handoff, determining whether or not the IP packet is of real-time traffic;

a means for bicasting the IP packet to both the previous foreign agent and the new foreign agent if the IP packet is of real-time traffic, and for buffering the IP packet in its agent if the IP packet is of non-real-time traffic; and

a means for, when the handoff has been completed and IP packets of non-real-time traffic are buffered, transferring the buffered IP packets of non-real-time traffic to the new foreign agent having the mobile terminal equipment.

Claim 29 (New): An agent apparatus, performing as a home agent or a gateway foreign agent, for transferring IP packets destined for a mobile terminal equipment in a mobile IP network, to which mobile terminal equipment is moving, the apparatus comprising:

a determining device configured to, upon receiving an IP packet destined for the mobile terminal equipment when the mobile terminal equipment is doubly registered during a handoff, determine whether or not the IP packet is of real-time traffic;

a bicasting device configured to broadcast the IP packet to both the previous foreign agent and the new foreign agent if the IP packet is of real-time traffic;

a buffer configured to buffer the IP packet in its agent if the IP packet is of non-real-time traffic; and

a transfer device configured to, when the handoff has been completed and IP packets of non-real-time traffic are buffered, transfer the buffered IP packets of non-real-time traffic to the new foreign agent having the mobile terminal equipment.